

44	PROCESS	79	.By treated material sampling means
45	.Plugging or tapping	80	.With analyzer or computation means
46	.Cooling	81	.With means supplying a treating agent
47	.Tuyere operation	82	..Correlated flow of diverse fluents
48	MEANS FOR CUTTING SOLID METAL WITH HEAT, E.G., BLOWPIPES	83	...With flow rate sensor
49	.With waste entrapping fluid	84	...With means sensing moisture content
50	.Means for cutting continuously cast workpieces	85	..Individual control of diverse inputs
51	.Means for removing surface material, e.g., scarfing	86	..By means positioning dispenser
52	..Having means to simultaneously scarf multiple sides of a workpiece	87	.With temperature sensor
53	..Having workpiece-contacting cutting means spacer	88	..In a fluid
54	.With means for cutting tubular workpiece	89	.With pressure sensor
55	..Having torch mount secured within workpiece	90	.With means responsive to condition of treated material
56	..Having means to circumrotate torch about workpiece	91	..By means sensing weight or density of work
57	..With means to rotate workpiece	92	..By means sensing position of work
58	.With pattern control means	93	...By means sensing presence or absence of work
59	.With tape-control means	94	...By means sensing level of molten liquid
60	..With automatic line-follower means	95	....By float means
61	..With means to rotate workpiece	96	WITH PROGRAMMED, CYCLIC, OR TIME RESPONSIVE CONTROL MEANS
62	..Having articulated arm supporting torch	97	.By timer
63	...With pantograph arm means	98	..Having driven disk or drum
64	..Having spaced, superposed templet	99	WITH RECORDING, INDICATING, INSPECTION OR MEASURING MEANS
65	.With work supporting grate means	100	.Having observation means
66	.Hand held, work riding torch	101	HAVING MEANS FOR LEACHING AND SUBSEQUENTLY PRECIPITATING A METAL
67	.With wheeled carriage torch mount	102	MEANS TREATING A CONTINUUM OF WORK
68	..Having work contacting torch spacing means	103	.With heating means
69	..With work-spanning torch mount	104	..By joule effect
70	.Circle cutter	105	..Discrete article continuum
71	.Having torch solely supported by workpiece	106	..Overlapped planar coil
72	.With cantilevered arm torch support	107	..In a molten material bath
73	..Having carriage-supported cantilevered arm	108	..In a muffle furnace
74	.Having adjuvant material feed	109	..With cooling by contact with solid heat sink
75	..Solid material	110	..In specific environment, e.g., vacuum
76	.Having torch spacing means	111	..With fluid contact means
77	.With torch mounting means	112	...In liquid bath
78	WITH CONTROL MEANS RESPONSIVE TO SENSED CONDITION	113	...In liquid spray

114	HAVING MEANS FOR CONTACTING A SOLID METALLIFEROUS MATERIAL OR METAL OBJECT WITH A LIQUID	142	GEOGRAPHIC OR STRUCTURAL INSTALLATION
115	.With means changing the shape of a treated object, e.g., roller means	143	.Having refining vessel with travelling support
116	..Spring shaping means	144	WITH MEANS TREATING OR HANDLING GASES EXHAUSTED BY TREATING MEANS
117	.With means to prevent warping of treated object	145	.Having means to treat or handle gases evolving from rotary furnace
118	..Of a gear wheel	146	.By contacting gas with nonmetallic liquid
119	..With heating of object	147	..By liquid spraying
120	.By immersing an article to be treated in bath of molten material, e.g., salt bath	148	.By condensing and collecting a volatile constituent
121	.With heating means, e.g., flame contact	149	..Within evacuated chamber
122	..By means treating metalliferous materials, e.g., ores	150	..Having molten metal splashing means
123	..By heating means adapted to be inserted into a hollow object	151	..By cascading material evolving the gas
124	..By means heating selected areas of an object	152	..By indirect liquid heat exchange means
125	...By means specialized to heat an article having an irregular contour (e.g., cams, gears)	153	..Having retort condenser
126	....By heating means configured to fit between adjacent gear teeth	154	..Vertical shaft furnace
127	..Unitized heating and fluid contact means	155	.With heat exchanger, e.g., waste heat boiler
128	..By electric heating means	156	.By means recycling exhaust gas
129	...Inductance type	157	.By separating particles from evolved gas
130	..Having bath for contacting the work with liquid	158	.Hood
131	...With means to agitate or control temperature of bath	159	.Offtake
132	...Having work introducing elevator	160	COMBINED OR CONVERTIBLE
133	...Having means to move work through bath	161	MEANS FOR EXTRACTING AND REFINING METAL
134	.By means contacting only selected areas of treated article with liquid	162	.With separate refining zone
135	WITH CLEANING OR LUBRICATING MEANS	163	..With rotating heating vessel
136	.Fluid injector cleaner	164	..With heated vertical extracting means
137	WITH MEANS TO COMMINUTE OR DISINTEGRATE SOLIDS	165	AMBULANT VESSEL
138	WITH MEANS TO PREHEAT GAS	166	TREATING VESSEL WITH DISTINCT MOLTEN MATERIAL HOLDING MEANS, E.G., FOREHEARTH
139	.Having heat storage means, e.g., checkers, stoves	167	THERMIT REACTION VESSEL
140	.By heat generating means	168	MEANS FOR TREATING ORES OR FOR EXTRACTING METALS
141	.By remote heat exchanger	169	.Amalgam-type extraction means
		170	.By means precipitating metal from solution
		171	.By means applying heat to work, e.g., furnace
		172	..Fluidized zone
		173	..Rotary drum-type furnace
		174	..With safety device

175	..With separate preheat chamber	209	...By upward flow of metal within treating zone
176	..With means for moving solid material to or through heating zone	210	....Recirculating material to its source
177	...By means for moving charge through zone	211	...Enclosed within casing
178	....Traveling grate	212	.Refining means with separate metal-melting zone
179	.....With seal means	213	.Revolving drum-type furnace
180	.....Train of grate elements	214	.Reverberatory refining vessel, e.g., open hearth
181	....Means forming cascading array	215	.Continuous refining
182	...By fluid current	216	.By means introducing treating material
183	...By power-driven means conveying solid charge into zone	217	..Gaseous treating material
184	...Bell and hopper type	218	...Having fluid inlet formed in vessel wall, e.g., tuyere
185	..With work supporting grate	219	....Having intersecting streams converging on central axis of vertical furnace
186	..With means for feeding fluids	220	....Having porous outlet
187	...With flow regulating means	221	....By means to introduce diverse material
188	...With common outlet means to feed diverse fluids	222	.....Concentric flow paths
189	...With means to cool fluid feeding means	223	....Having control means
190	..With cooling of heating means	224	....Having tuyere formed in plug bottom
191	...By means cooling material discharge means	225	...Lance
192	...By direct fluid contact	226	....With manipulating means
193	...By means embedded in heating means	227	.By separating metal in a molten mass from undesired material, e.g., slag
194	....Having means to facilitate removal of cooling means	228	..By skimming a material
195	..With discharge means	229	..By baffle means
196	...With trough-shaped outlet, e.g., runner	230	...At discharge outlet
197	..Shaft-type furnace, e.g., blast furnace	231	...In discharge trough, e.g., runner
198	...Having external support	232	..Settling receptacle, e.g., slag pot
199	...Having specific top structure	233	.By stirring or mixing molten metal
200	MEANS FOR MELTING OR VAPORIZING METAL OR TREATING LIQUEFIED METAL	234	..Induction stirring
201	.Slag refining means	235	..Having impeller means
202	.Spray refining means	236	.With means to discharge molten material
203	.By means specialized to puddle metal	237	..Including electromagnetic means
204	.Means applying centrifugal force	238	..Means for removing residual material
205	.Means to melt and separate metal from mass of diverse constituents	239	..By changing ambient pressure on material surface, e.g., suction
206	.Means for melting-type material, e.g., Linotype	240	..With means to tilt heating means
207	.By providing, treating or protecting environment, e.g., vacuum	241	.With means to cool treating means
208	..By application of vacuum	242	.Heated melting pot

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|-----|---|-------|---|
| 243 | .Bessemer-type treating vessel | 275 | .Receptacle |
| 244 | ..By mounting vessel to revolve about its longitudinal axis | 276 | ..With means movably supporting receptacle |
| 245 | ..With means pivotally mounting vessel | 277 | ...By bed of rollers |
| 246 | ...Means mounting vessel to trunnion ring | 278 | ..Having corrugated wall |
| 247 | ...Means mounting vessel to U-shaped trunnion support means | 279 | .Grate |
| 248 | .Horizontal, rotatable, cylindrical type | 280 | LININGS |
| 249 | MEANS TREATING SOLID METAL | 281 | .With making or repairing means |
| 250 | .Having evacuated chamber | 282 | .With metallic means to prevent lining abrasion |
| 251 | .By contact with gas | 283 | .Having particular lining element shape |
| 252 | ..With heating means | 284 | .Having specific grain size |
| 253 | ...Bottom feeding furnace | 285 | .With means allowing for expansion |
| 254 | ...With indirect heat-exchange means for gas | 286 | .With specific lining enclosing structure |
| 255 | ...Having work contained in separate, noncommunicating chamber, e.g., muffle | 287 | MISCELLANEOUS |
| 256 |Bell furnace | | |
| 257 | ...Having atmosphere generating means within treating zone | | <u>CROSS-REFERENCE ART COLLECTIONS</u> |
| 258 | ..By contacting only selected areas of object | 900 | METAL MELTING FURNACES, E.G., CUPOLA TYPE |
| 259 | .By cooling of the solid | 901 | SCRAP METAL PREHEATING OR MELTING |
| 260 | ..By contact with solid heat sink | 902 | BLOWPIPES SPECIALIZED TO TRANSVERSELY CUT OR NOTCH BLOOMS, BILLETS OR BARS |
| 261 | .By flame contact heating | 903 | SAFETY SHIELDS |
| 262 | .Fluid tight heat transferring box shield or hood (e.g., annealing box) | 904 | BLOWPIPE CUTTING HEADS |
| 263 | ..Bell-type hood, or support for such hood | 905 | REFRACTORY METAL-EXTRACTING MEANS |
| 264 | ...Having packing at hood lip | | |
| 265 | MEANS FOR INTRODUCING FLUENT INTO VESSEL, E.G., TUYERE | | <u>FOREIGN ART COLLECTIONS</u> |
| 266 | .With flow control means or internal flow guide | FOR | CLASS-RELATED FOREIGN DOCUMENTS |
| 267 | .Having means for simultaneously feeding diverse materials | | |
| 268 | ..Having plural outlets | | <u>DIGESTS</u> |
| 269 | .Having drain means or cleaner insertion means, e.g., punch hole | DIG 1 | REPAIR OR RESTORATION OF APPARATUS |
| 270 | .Having means preventing damage to introducing means, e.g., wear linings, cooling | | |
| 271 | MEANS SEALING OR OPENING APERTURE IN VESSEL | | |
| 272 | .By means plugging aperture | | |
| 273 | ..By means injecting plugging compound, e.g., mud gun | | |
| 274 | MEANS FOR HOLDING OR SUPPORTING WORK | | |